

## **MODULE III - TREATMENT OF ENERGETIC WASTES**

### **III.A. APPLICABILITY**

The requirements of this permit module pertain to the treatment of energetic military waste at the UTTR in Box Elder County, Utah. The Permittee shall comply with UAC R315-8 and all conditions of this module.

- III.A.1 The permit conditions of this module allow treatment at the HWMU designated as the Thermal Treatment Unit (TTU), as designed and described in the drawings and specifications in Attachment 1. The TTU consists of Sites 1 and 3 for open burning and Site 2 for open burning or open detonation.
- III.A.2. The OB/OD at the TTU shall only be accomplished by Explosive Ordnance Detachment (EOD) Personnel in accordance with DOD OB/OD Operational Directives and Best Management Practices (BMPs) and the conditions of this permit. A list of relevant directives is in Table 2 of Attachment 3.

### **III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION**

- III.B.1 The Permittee may thermally treat only hazardous waste military munitions at the TTU generated from the following general sources:
  - III.B.1.a. Unserviceable or serviceable excess munitions and explosive materials (e.g. bulk explosives, small arms munitions, projectiles, flares, grenades, sub-munitions, bombs and rocket motors);
  - III.B.1.b. Unserviceable or serviceable excess solid propellant components and associated residue for which a USAF contract exists and the contractor requests treatment assistance; and
  - III.B.1.c. Explosive residues generated from OO-ALC (Ogden Air Logistics Command) testing facilities and laboratories.
- III.B.2. The Permittee may only thermally treat hazardous waste military munitions with the classifications or compositions in the *Waste Characterization Technical Memorandum for Hill Air Force Range* in Attachment 2.
- III.B.3. The Permittee is prohibited from treating hazardous waste from sources not identified in Condition III.B.1, and from classes and compositions not included in Condition III.B.2., including wholly inert items and improvised explosive devices (e.g. homemade bombs which are non-military), chemical and nuclear warheads, their devices and components and military energetic wastes that contain free liquids.

- III.B.4 The Permittee may OB/OD only the following hazardous wastes, as indicated by EPA hazardous waste code, in the table below and subject to the prohibitions of Conditions III.B.1 and III.B.2. The Permittee shall not exceed the maximum Net Explosive Weight (NEW) for each event as listed below:

Site	EPA Code	OB (NEW lb)	OD (NEW lb)
1	D003	320,000	NA
2 (Pads 1, 2 and 3)	D003	320,000	149,900
3	D003	1,000	NA

- III.B.5. Addition of hazardous waste codes to Conditions III.B, requires modification of the permit as specified in R315-4-1.5 and Condition II.B.5.
- III.B.6. The Permittee shall comply with the waste compatibility requirements of UAC R315-8-2.8.

**III.C. GENERAL OPERATING CONDITIONS**

- III.C.1. To meet the performance standards of UAC R315-8-16, the Permittee shall adhere to site specific BMPs and EOD Operational Directives contained in the operating record and listed in Attachment 3 including the following non-site-specific OB/OD Best Management Procedures (BMPs):
- III.C.1.a. OB/OD operations shall be conducted within the secure area of the TTU with controlled access. At a minimum, AFM 91-201, Explosives Safety Standards, shall be used to dictate safe separation distances from external receptors.
- III.C.1.b. The TTU shall be posted with warning signs to keep unauthorized personnel out. Warning flags shall fly and access roads shall be barricaded and posted during OB/OD operations.
- III.C.1.c. During OB/OD operations, telephone or two-way radio contact shall be maintained with support personnel, including security and fire fighting units.
- III.C.1.d. The integrity of the TTU and support equipment shall be determined through regular inspections and in accordance with the inspection plan in Attachment 5. Inspection records shall be maintained at the facility.

- III.C.1.e. A training plan shall be followed by all operators of the TTU in accordance with Condition II.I. The training program shall include operational practices and site-specific hazardous waste handling procedures.
- III.C.1.f. Prior to treatment at the TTU, meteorological data including wind speed and direction, approach of storms (including electrical storms), precipitation, cloud cover, visibility and inversions (temperature with altitude) shall be monitored to ensure that treatment is not conducted under adverse weather conditions. Meteorological data shall be recorded for each burn or detonation and maintained at the facility.
- III.C.1.g. Energetic wastes shall be treated within 24 hours of receipt at the UTTR.
- III.C.1.h. Prior to treatment, waste munitions shall be inspected to ensure that only waste defined in Condition III.B. is burned or detonated.
- III.C.1.i. Within 24 hours after each OB/OD operation, EOD personnel shall inspect the area for ejected material, untreated waste. Any untreated waste shall be immediately retreated or saved for treatment the following day. When feasible, ejected metal materials shall be stored for recycling.
- III.C.1.j. Residues from burning shall be removed after each treatment event. Metal waste shall be separated from the ash and other residue and recycled whenever feasible.
- III.C.1.k. Residues from detonation, such as surface exposed scrap metal, casings, fragments and related items shall be collected after each event.
- III.C.1.l. The donor charge and placement geometry for OB/OD operations shall be optimised to minimize the generation of unburned and un-detonated waste and residue. All re-burns and re-detonations shall be recorded in the operating record.
- III.C.1.m. The OD and OB events at Sites 1 and 2 shall be unconfined, including not covering or burying with soil, to encourage high order burns and detonations.
- III.C.1.n. The OB and OD operations shall not generate noise or ground vibration at levels that will have an adverse effect on nearby onsite and offsite receptors. Results of noise modelling prior to each detonation greater than 10,000 lb NEW shall be in the operating record. Copies of completed AFMC Form 3514, *Noise Complaint*, shall be in the operating record.
- III.C.1.o. The Permittee shall have a noise prediction, mitigation and management program as described in Attachment 11.

- III.C.1.p. The Permittee shall have available, during each burn or detonation, adequate fire protection equipment and containment measures (e.g. firebreaks) to assure the confinement and control of any fire resulting from the OB/OD operations.
- III.C.2 The Permittee shall operate the TTU to prevent unacceptable risk of cancer and non-cancer effects to on-site workers and off-site residents and to minimize significant effects to the ecosystem surrounding the TTU. The Permittee shall maintain compliance with the environmental performance standards listed in UAC R315-8-16 and update the information in Attachment 10 annually according to Condition II.F.2.
- III.C.3. The Permittee shall adhere to the following conditions to prevent unacceptable risk of cancer and non-cancer effects due to exposure to OB or OD emissions:
- III.C.3.a. The cumulative carcinogenic risk to on-site workers shall not exceed  $1.0 \times 10^{-4}$  (one in one hundred thousand) for the closest potential receptors which are the worker positioned on Knob Hill and the worker at the Oasis complex. The risk shall be calculated according to the methodology in Attachment 10. The maximum NEW, including donors and initiators, to be treated at the TTU shall not exceed 149,900 lbs. per detonation or 320,000 lbs. NEW per burn.
- III.C.3.b. The cumulative non-carcinogenic hazard to the closest on-site potential receptors of the burn or detonation shall not exceed a hazard index of 1.0 for any 24-hour period immediately following initiation of a burn or detonation. The closest potential receptors are the worker positioned at Knob Hill and the worker at the Oasis complex. The hazard shall be calculated according to the methodology in Attachment 10. The maximum NEW, including donors and initiators, to be treated at the TTU shall not exceed 30,000,000 lbs. per year.
- III.C.3.c. The cumulative carcinogenic risk to actual or potential off-site receptors shall not exceed  $1.0 \times 10^{-6}$  (one in a million). The cumulative non-carcinogenic hazard to actual or potential off-site receptors shall not exceed a hazard index of 1.0 for any 24-hour period following initiation of a burn or detonation.
- III.C.4. The Permittee shall submit, for review and approval by the Executive Secretary, a protocol or plan for assessing the risk to the existing and surrounding ecosystems as a result of continued OB/OD operations at the TTU. The protocol or plan shall be submitted within 120 days of permit issuance. The ecological risk assessment shall be submitted within 160 days of approval of the protocol. After approval of the Ecological Risk Assessment by the Executive Secretary, the permit shall be modified to add performance standards for acceptable ecological risk.

**III.D. SPECIFIC OPERATING CONDITIONS**

**III.D.1. Open Burning on Site 1**

III.D.1.a The Permittee shall operate and maintain the approved burn pad on the ground surface based on the design in Attachment 1 and in accordance with the following conditions:

III.D.1.a.i. The open burning pad shall be used to burn only rocket motors and bulk propellant.

III.D.1.a.ii An area with a 200 feet radius surrounding the burn pad shall be free of plant or other combustible material to prevent fires.

III.D.1.a.iii The OB operation may be initiated by placing dunnage on the pad and igniting it with diesel fuel provided that a solid waste burn variance is obtained from the Board in accordance with UAC R315-317-2 and is current. The amount of fuel and dunnage shall be minimized to that necessary to accomplish the OB event in compliance with the conditions of the variance.

III.D.1.b. The Permittee shall operate the burn pad in order to minimize exposure to air emissions in accordance with the following conditions which shall be recorded in the operating record:

III.D.1.b.i. No burn shall be initiated when the wind direction is from the TTU to Bug Knoll or the Oasis complex.

III.D.1.b.ii. No burn shall be initiated when the wind speed is in excess of 15 mph or less than three mph.

III.D.1.b.iii. No burn shall be initiated when an inversion is present.

III.D.1.b.iv. No burn shall be initiated when the visibility is less than one mile.

**III.D.2. Open Detonation at Site 2, Pads 1, 2 and 3.**

III.D.2.a. The Permittee shall operate and maintain Pads 1, 2 and 3 on the ground surface in accordance with the design plans in Attachment 1.

III.D.2.b. The Permittee shall operate and maintain the detonation pads in accordance with the following conditions which shall be recorded in the operating record:

III.D.2.b.i Detonations shall occur during daylight hours, sunrise to sunset.

III.D.2.b.ii Detonations shall not be initiated when the wind speed is in excess of 15 mph or less than three mph.

- III.D.2.b.iii. Detonations shall not be initiated when the wind direction is from the TTU to Bug Knoll or the Oasis Complex.
- III.D.2.b.iv. The Net Explosive Weight (NEW) treated by OD operation shall not exceed the limit stated in permit Condition III.B.4 for each event.
- III.D.2.b.v. Open detonations shall not occur on more than one pad at one time
- III.D.2.b.vi. Open detonations shall not be initiated when an inversion is present.
- III.D.2.b.vii. Open detonations shall not be initiated when the visibility is less than one mile.
- III.D.2.b.viii. Any fires started from kick out from a detonation shall be extinguished within a reasonable timeframe.
- III.D.2.c. Within 24 hours of completion of an OD event, EOD personnel shall visually inspect the detonation pad for fragments. Fragments containing energetic residue will be re-detonated in place. Fragments that do not contain energetic residue will be collected, characterized and accumulated for disposal or recycling.
- III.D.3. **Open Burning in the Miscellaneous Munitions Burn Pan (Site 3)**
- III.D.3.a. The Permittee shall operate and maintain the burn pan in accordance with the design plans and specifications in Attachment 1.
- III.D.3.b. The Permittee shall operate and maintain the munitions burn pan in accordance with the following conditions:
  - III.D.3.b.i. Open burning shall be conducted only during daylight hours, sunrise to sunset.
  - III.D.3.b.ii. The Permittee shall operate and maintain a lid on the burn pan to keep out precipitation, vegetation and wildlife.
  - III.D.3.b.iii. The Permittee shall manage accumulated precipitation in accordance with the WAP in Attachment 3.
  - III.D.3.b.iv. The Permittee shall treat only waste identified in Condition III.B.1 and small arms ammunition greater than or equal to .50 caliber.
- III.D.3.c. The Permittee shall operate and maintain the burn pan in order to minimize exposure to air emissions in accordance with the following conditions:
  - III.D.3.c.i. The area surrounding the burn pan shall be inspected for untreated explosives, propellant material, or other kick out material after each burn. Non-energetic residue will be collected, characterized and accumulated for disposal or recycling. Energetic residue that is safe to handle will be stored at the 90-day area at the

TTU and treated at the next OB operation. Energetic residue that is not safe to handle will be retreated within 24 hours at the TTU.

- III.D.3.c.ii. An area with a 50 ft radius surrounding the burn pan shall be free of plant or other combustible material to prevent fires.
- III.D.3.d. The integrity of the munitions burn pan and the concrete secondary containment shall be evaluated by March 1 of each year the pan is in operation. A report of the evaluation, signed by an independent registered professional engineer, shall be submitted to the Executive Secretary by March 31 of each year.
- III.D.3.e. The Permittee shall use combustible material and fuel oil as an initiator of the burn in accordance with the following conditions:
  - III.D.3.e.i. The combustible material shall consist of wooden ammunition crates and/or pallets, non-explosive contaminated scrap wood and cardboard boxes used to pack and ship the items to be treated.
  - III.D.3.e.ii. The fuel shall be less than 50 gallons of No. 2 diesel fuel.

**III.E. RESIDUE AND ASH MANAGEMENT**

- III.E.1. All residue and ash generated from OB/OD operations shall be managed in accordance with the procedures in Attachment 3 and the following conditions:
  - III.E.1.a. The Permittee shall collect and manage any hazardous waste kick-out or other hazardous residue from detonations or ash from burns from areas other than the burn pan within three working days of each burn or detonation.
  - III.E.1.b. The ash will be collected and placed in steel drums.
  - III.E.1.c. The burn pan shall remain closed until the ash is removed.
- III.E.2. Sampling and analysis of drummed ash shall be performed according to the procedures in the *Waste Analysis Plan for Residue and Ash* in Attachment 3.

**III.F.            INSPECTION SCHEDULES AND PROCEDURES**

- III.F.1            The Permittee shall inspect each of the treatments units in accordance with the inspection requirements in Attachment 5. The Permittee shall conduct inspections of each unit at the TTU on each day of treatment.

**III.G.            ENVIRONMENTAL MONITORING REQUIREMENTS**

**III.G.1            Soil Monitoring at Sites 1 and 2 for OB and OD on the ground**

- III.G.1.a.            A TTU treatment zone shall be defined as the two square mile area described in Attachment 1 and extending five feet below ground surface. Within 90 days of permit issuance, a sampling plan to quantify the organic, inorganic and explosive constituents in the treatment zone soils shall be submitted for review and approval by the Executive Secretary.
- III.G.1.b.            The data from the soil sampling shall be used in a human health risk assessment to evaluate the risk to workers at the TTU due to direct exposure to the soils. The risk assessment shall be submitted within one year of permit issuance and reviewed and approved by the Executive Secretary.
- III.G.1.c.            The Permittee shall modify this permit to include the risk assessment for exposure to soils at the TTU and to include a list of Contaminants of Concern and Concentration thresholds for soil in the treatment zone to protect workers at the TTU. Based on results from the initial sampling, analysis and risk assessment, the Sampling and Analysis Plan in Attachment 9 shall be modified to include a plan for sampling the soils annually to ensure the risk thresholds are not exceeded.
- III.G.1.d.            The Permittee shall submit a soil analysis report to the Executive Secretary within 90 days of any soil sampling event. The report shall contain the validated analytical data, soil sampling location map, a detailed analysis of the data and other pertinent information to determine if remediation of the soils is necessary
- III.G.1.e.            Should analytical results from any soil sampling event indicate that the soil constituents exceed an acceptable risk threshold, the Permittee shall submit a Corrective Action Plan in accordance with Module IV.

**III.G.2.            Soil Monitoring Adjacent to Site 3 Burn Pan**

- III.G.2.a.            The Permittee shall sample the soil adjacent to the burn pan at Site 3 annually, for every year the pan is in operation, according to the procedures in Attachment 9.



**III.G.3. Groundwater Monitoring**

- III.G.3.a. Within 90 days of permit issuance, the Permittee shall submit to the Executive Secretary for review and approval, a request to modify the Sampling and Analysis Plan in Attachment 9, to include a groundwater monitoring program to comply with the requirements of UAC R315-8-6.9. The program shall include the following:
- III.G.3.a.i. Procedures to collect groundwater samples annually from TTU groundwater monitoring wells TTU-1 and TTU-2;
  - III.G.3.a.ii. A list of Contaminants of Concern, to include those constituents listed in Table 1 in Attachment 9, as required by UAC R315-8-6.4;
  - III.G.3.a.iii. A list of concentration limits (UAC R315-8-6.5) for constituents established under UAC R315-8-6.4 and Table 1 in Attachment 9;
  - III.G.3.a.iv. Procedures for statistical evaluation of the data in determining whether background values of concentrations have been exceeded as defined in UAC R315-8-6.8(h);
  - III.G.3.a.v. Procedures to determine groundwater elevations of each well prior to each sampling event;
  - III.G.3.a.vi. Procedures to sample and analyze unfiltered groundwater samples; and
  - III.G.3.a.vii. A Quality Assurance Project Plan.
- III.G.3.b. The point of compliance, for operations at the TTU, shall be a vertical surface extending through wells TTU-1 and TTU-2, both of which are down gradient from the TTU operations.
- III.G.3.c. Within 60 days of receiving the analytical data from the laboratory, the Permittee shall provide the Executive Secretary with a groundwater monitoring report that includes the information required by Condition V.J.2.b.
- III.G.3.d. The Permittee shall notify the Executive Secretary if there is a statistically significant increase of the concentration of a COC or the background concentration for any constituent listed in Condition III.F.3.a.ii. The Permittee shall:
- III.G.3.d.i. Notify the Executive Secretary within seven calendar days of the detection of the increase;

- III.G.3.d.ii. Resample the well or wells that have exceeded the concentration limits in Condition III.F.3.a.iii. and provide the results to the Executive Secretary within 30 days of the initial sampling event to determine if compliance monitoring is required; and
- III.G.3.d.iii. Within 90 days of determination by the Executive Secretary that compliance monitoring is required for one or more wells, the Permittee shall request to modify the permit to establish a compliance monitoring program to meet the requirements of UAC R315-8-6.10 and Condition V.K.
- III.G.3.e. Abandonment of any monitoring well shall be accomplished in a manner that prevents vertical movement of water and possible contaminants within the borehole and the annular space surrounding the well casing. The Permittee shall comply with Utah Division of Water Rights rules for well abandonment.
- III.G.4. **Surface Water Monitoring**
- III.G.4.a. The Permittee shall, three days after the last storm event, sample any water that ponds in surface depressions within the TTU boundary for more than three days, with a maximum of one sampling event every 30 days. A 30-day period begins with the first sampling event. The samples shall be analyzed for the constituents listed in Table 1 in Attachment 9.
- III.G.4.b. The Permittee shall submit to the Executive Secretary an annual surface water monitoring report that shall contain the monitoring data specified in Condition III.F.4.a. The report shall be submitted by the end of each calendar year. Analytical results shall be reported for both filtered and unfiltered samples.
- III.G.4.c. Within 90 days of permit issuance the Sampling and Analysis Plan in Attachment 9 shall be revised to include sampling procedures for surface water.
- III.G.5. **Notification**
- III.G.5.1. Except for surface water sampling specified in Condition III.G.4., the Permittee shall notify the Executive Secretary at least ten days prior to each sampling event to allow the Executive Secretary to observe the sampling and to take split or confirmation samples.
- III.H. **FACILITY MODIFICATION/EXPANSION**
- III.H.1. Modification of the design plans and specifications in Attachment 1 and construction of additional treatment units shall be allowed only in accordance with UAC R315-4-1.5.

**III.I. CLOSURE AND POST CLOSURE**

- III.I.1. The Permittee shall close the TTU in accordance with the Closure Plan in Attachment 8 or conduct post-closure monitoring in accordance with a Post-Closure Plan to be submitted in accordance with Condition II.P.11.

**III.J. TTU OPERATING RECORD**

- III.J.1. The Permittee shall maintain an operating record at the Facility describing the OB/OD activities. Portions of the operating record may be maintained at the area where the report is generated. The record shall include the following information:
- III.J.1.a. The requirements of UAC R315-8-5.3.
- III.J.1.b. Description and quantity (number and NEW) of all energetic hazardous waste received and treated at the TTU.
- III.J.1.c. Date of treatment.
- III.J.1.d. Copies of manifests showing disposition of burn residues, ADRs and a description of solid waste used as initiators that were burned or detonated.
- III.J.1.e. Current copies of all BMPs and EOD Directives used at the TTU.
- III.J.1.f. An annual running total of the NEW of energetics treated at the TTU.
- III.J.1.g. Meteorological conditions during each burn or detonation as listed in Condition III.C.1.f.

**III.K LAND USE PROVISIONS**

- III.K.1. The ecological and human health risk assessments and the noise prediction and mitigation procedures in Section E of the 1997 Permit application assume land surrounding the TTU, except for the buildings around the Oasis compound, is devoid of development and dedicated to military training and weapon testing. The assessments assume that the nearest off-site receptors to the UTTR are boaters on the Salt Lake as the land surrounding the facility is Public, State and BLM administered land used for livestock grazing.
- III.K.2. The Permittee shall submit annually to the Executive Secretary a land use assessment to ensure that the land surrounding the TTU is devoid of development and that the land uses in Section E-5c of the permit application are valid. The assessment shall be a letter report and shall be coordinated with the annual evaluation of the risk assessments in Attachment 10, as required by Condition II.G.2.

**III.L        COMPLIANCE SCHEDULE**

- III.L.1.        Within 90 calendar days of permit issuance, the Permittee shall submit, in accordance with Condition III.G.1.a, a Sampling and Analysis Plan to quantify the organic, inorganic and explosive content of the TTU treatment zone soils.
- III.L.2.        Within 120 days of permit issuance, in accordance with Condition III.C.2.1.d. the Permittee shall submit, for review and approval by the Executive Secretary, a protocol for assessing the risk to the ecosystems surrounding the TTU as a result of OB/OD operations.
- III.L.3.        Within 180 calendar days of permit issuance, the Permittee shall submit a permit modification to update the *Waste Characterization Technical Memorandum* in Attachment 2.
- III.L.4.        The Permittee shall annually submit the following:
  - III.L.4.a.        In accordance with Condition II.F.2., a report that contains a review and update of the performance standards and risk assessments in Attachment 10;
  - III.L.4.b.        In accordance with Condition II.D.1.a., by March 1 of each calendar year, an updated version of the *Waste Characterization Technical Memorandum* in Attachment 2;
  - III.L.4.c.        A waste minimization statement in accordance with Condition II.O.2.; and
  - III.L.4.d.        A report evaluating alternatives to OB/OD treatment technology, in accordance with Condition II.O.2.
- III.L.5.        Within 60 days of permit issuance, the Permittee shall submit a revised Table 1 in Attachment 7 listing the name, work phone number and home phone number of all persons qualified to act as facility emergency coordinators in accordance with UAC R315-8-4.3(c).